

Attorney's Docket: 2002DE141
Art Unit: 1793
Serial No.: 10/532,565
Response to Non-final Office Action Mailed 11/13/2008

REMARKS

The Office Action mailed November 11, 2008 has been carefully considered together with each of the references cited therein. The amendments and remarks presented herein are believed to be fully responsive to the Office Action. Reconsideration of the present Application in view of the following remarks is respectfully requested.

Applicant has amended the specification to place the Specification in proper form and attend to formalities. On page 2 at the end of the third full paragraph, Applicant has added the words without the use of a carrier gas stream following the words 'discharging the liquid phase continuously from the swirl chamber through an outlet aperture'. **Support for this amendment may be found in Applicant's originally filed claim 1.** It is believed that no new matter has been added to the specification.

Applicant has amended the claims to more clearly recite what Applicant believes to be the invention. In claim 1, Applicant amended claim 1 to recite that the two or more liquids were sprayed into a swirl chamber having an internal space and having a cross-sectional area, wherein the two or more nozzles are not coaxially aligned with one another, at a pressure of between 1 and 1000 bar, and with a volume flow of between 5 and 500 l/h, to provide a volume of a liquid phase in the internal space of the swirl chamber and to induce turbulent mixing of the liquid phase, said volume limited to a degree such that the turbulent flow in the liquid phase is maintained, with physical alteration, and, after physical alteration has taken place, discharging the liquid phase continuously from the swirl chamber through an outlet aperture without the use of a carrier gas stream. Support for the amendment to claim 1 may be found in Applicant's Specification on page 3, lines 1-2, and lines 21 – 24 and in originally filed claim 1. It is believed that no new matter has been added by this amendment.

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Applicant's invention represents an improvement in the art of preparing organic pigments. Prior art methods relied on introducing the reactants into a gas atmosphere wherein high velocity reactant streams or jets are injected into a gas space of reactor in a manner such that the jets do not impinge on the walls of the reactor. This was accomplished by focusing the jets at a point away from the reactor walls which required the jets to collide in the gas atmosphere for mixing to take place. Still further, a sweep gas or carrier gas stream was passed through the reaction zone and acted to carry the product of the reaction (the pigment) from the reaction zone. However, it was difficult to maintain the focal point or point of conjoint collision of the reactant streams, particularly in a commercial system where flow interruptions in one jet or another may occur, often resulting in the plugging of the reactor. Applicant's invention represents a significant improvement by injecting the liquid reactants, not into a gas phase, but instead injecting the liquid reactants directly into a mixing or swirl chamber internal space in which a volume of the liquid phase is established, and wherein turbulent mixing takes place in the liquid phase, the volume in the swirl chamber limited to a degree such that the turbulent liquid flow state is maintained. In Applicant's invention there is no requirement to maintain a point of collision of reactants in a gas atmosphere, and there is no requirement for a carrier gas to sweep the reaction zone to maintain a gas atmosphere in the reaction chamber and to remove the resulting product pigment. These represent significant commercial and economic benefits over the prior art device. Furthermore, Applicant achieved a more stable operation by carrying out the reaction in an all liquid phase under turbulent conditions and further by inducing turbulent mixing in a swirl chamber.

Claim 1 was rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement for not providing support for the limitation in claim 1 for discharging the liquid phase "without the use of a carrier gas stream". The rejection of claim 1 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement for not providing support for the limitation in claim 1 for discharging the liquid phase "without the use of a carrier gas stream" is improper and should be withdrawn for the reason that the phrase was

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present in originally filed claim 1. Furthermore, Applicant has incorporated the phrase "without the use of a carrier gas stream" into the Specification by the above amendment to page 2 of the Specification. The support for this amendment is that the phrase "without the use of a carrier gas stream" was present in the originally filed claim 1, which is acknowledged to be a part of Applicant's original Specification.

Claims 1-3, 7-18, and 20 were rejected under 35 U.S.C. §103(a) as being unpatentable over Dietz et al. (US 6,337,364)-hereinafter referred to as the '364 Patent. The rejection of claim 1 as amended under 35 U.S.C. §103(a) as being unpatentable over Dietz et al. (US 6,337,364) should be withdrawn for the reason that the '364 Patent teaches away from Applicant's invention. The '364 Patent discloses and claims a method for the fine division of pigments which comprises dissolving one or more coarsely crystalline crude pigments in a solvent and precipitating them with a liquid precipitation medium by spraying them with a liquid precipitation medium by spraying the pigment solution and the precipitation medium through nozzles "to a point of conjoint collision in a reactor chamber (See the '364 Patent at column 1, lines 50-56) The '364 Patent defines the "point of conjoint collision" as the collision point at which the jets impinge on one another(See column 1, line 56 and column lines 8-15 and by way of illustration at lines 49-52). Further, **the '364 Patent requires the presence of a carrier gas to be passed through the reactor chamber in the vicinity of the collision point to maintain the gas atmosphere in the reactor chamber (See Abstract and col. 1, lines 59-61 and column 2, lines 10-15 and claim 1) " and especially at the point of collision of the jets", and to carry or remove the pigment suspension from the reactor and provide effective cooling of the reactor and to prevent wear on the reactor internal surfaces (See column 1, lines 59-66 and Column 2, lines 11-15). The '364 Patent discloses (at column 2, lines 10-15) that the gas atmosphere "is maintained by means of the introduced gas or evaporating liquid", and the reference further states that the colliding jets are not braked by the gas atmosphere prior to their collision, as would be the case...if they has to pass through a liquid. The method and apparatus of the '364 Patent differ from the method and apparatus of instant invention. There is no swirl chamber in the '364 Patent which contains a volume of liquid phase which is**

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maintained in a turbulent liquid flow regime. The '364 Patent teaches away from any liquid phase being present in a significant volume in the reactor, particularly any liquid phase in a turbulent flow regime, for the reason that the presence of such a volume of turbulent liquid in the method or apparatus of the '364 Patent would interfere with the operation of the jets. the liquid phase disclosed in the '364 Patent and make both the method and the apparatus inoperable. It is not disclosed in the '364 Patent that any swirl is or would be created at the point of conjoint collision, especially if the resulting suspension is immediately removed from the reactor with a carrier or purge gas (See '364 Patent at column 2, lines 10-15 and claim 1). Applicant's invention differs from the methods disclosed in the '364 Patent in the following ways:

1. reactants are not injected into a gas filled space
2. there is no point of conjoint collision in a gas atmosphere
3. there is no carrier gas
4. there is a swirl chamber for turbulent mixing of an all liquid phase.
5. There is a volume of liquid phase in the swirl chamber and the liquid in the volume is maintained in turbulent liquid flow regime.

According to Applicant's invention, the pigment liquids or suspensions are introduced into a swirl chamber by two or more nozzles which are not "coaxially aligned" to almost completely fill the internal space of the swirl chamber and to induce turbulent mixing of the liquid phase, and the mixed liquid phase is continuously discharged from the swirl chamber through an outlet aperture **without the use of a carrier or sweep gas stream**. Applicant's claim 1 specifically recites that the nozzles are "not coaxially aligned" which anyone skilled in the art would recognize that when the nozzles are not mounted on or do not have a common axis (coaxially aligned), this would result in the absence of a "point of conjoint collision", and furthermore, claim 1 recites that the instant method is accomplished "without the use of a carrier gas stream". Still further, Applicant discloses that the components or reactants are injected into the swirl chamber which contains a liquid phase (thus being injected through a turbulent liquid phase) under turbulent flow conditions which

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is not the same as a flocculation stabilizing liquid medium. Conjoint collision cannot and does not occur in Applicant's invention, because Applicant requires that the jets not be coaxially aligned in order to provide turbulent mixing in a liquid phase in a swirl chamber. The variations in the angle at which the jets strike one another does not change the requirement that the jets in the '364 Patent still must have a point of conjoint collision. Furthermore, anyone skilled in the art would recognize that to modify the method or apparatus of the '364 Patent by realigning the nozzles so that the nozzles were not coaxially aligned would eliminate this required point of conjoint collision (See column 1, line 56 and claim 1) and removing the gas phase would make the process of the '364 patent inoperable. Regardless of the angle of the nozzles, Applicant's invention requires that nozzles are not coaxially aligned with one another, whereas such coaxial alignment is critical to the operation of the '364 Patent. No one skilled in the art armed with the disclosure of the '364 Patent would be motivated to arrive at Applicant's invention when the '364 Patent teaches away from Applicant's method. Therefore, the rejection of claim 1 as amended under 35 U.S.C. §103(a) as being unpatentable over Dietz et al. (US 6,337,364) should be withdrawn for the reason that the '364 Patent teaches away from Applicant's invention.

The rejection of claims 2, 7-10, and 20 under 35 U.S.C. §103(a) as being unpatentable over Dietz et al. (US 6,337,364) should be withdrawn for the reasons given in support of claim 1 from which they depend.

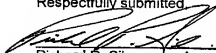
Claims 1, 4-6 and 19 were rejected under 35 U.S.C. §103(a) as being unpatentable over Dietz et al. (2002/0040662)(hereinafter referred to as the '662 Publication) in view of Dietz et al. (US2002/0055619)(hereinafter referred to as the '619 Publication). The rejection of claim 1 as amended under 35 U.S.C. §103(a) as being unpatentable over Dietz et al. (US2002/0040662) in view of Dietz et al. (US2002/0055619) should be withdrawn for the reason that the '662 and '619 Publications disclose methods and limitations equivalent to the previously discussed '364 Patent which Applicant has shown teach away from Applicant's invention. The rejection of claims 4-6 and 19 under 35 U.S.C. §103(a) as being unpatentable over

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Dietz et al. (US2002/0040662) in view of Dietz et al. (US2002/0055619) should be withdrawn for the reasons given in support of claim 1 from which they depend.

It is respectfully submitted that, in view of the above remarks, the objections to the specification and the claims, the rejections under 35 U.S.C. §112 and §103 should be withdrawn and that this application is in a condition for an allowance of all pending claims. Accordingly, favorable reconsideration and an allowance of all pending claims are courteously solicited.

Respectfully submitted



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